WHAT IS CLAIMED IS:

1. An exhaust emission control system of an internal combustion engine, comprising:

exhaust gas purifying means provided in an exhaust passageway of said internal combustion engine;

flow direction switching means including four ports and provided at an exhaust passageway disposed more upstream than said exhaust gas purifying means;

a first exhaust passageway connected to said internal combustion engine and further to a first portion of said flow direction switching means:

a second exhaust passageway communicating with the atmospheric air and further to a second port of said flow direction switching means;

a third exhaust passageway connected to one side of said exhaust gas purifying means and further to a third port of said flow direction switching means; and

a fourth exhaust passageway connected to the other side of said exhaust gas purifying means and further to a fourth port of said flow direction switching means,

wherein said flow direction switching means can be switched over to a first position for permitting the exhaust gas to flow in a direction through said exhaust gas purifying means by connecting the first port to the third port and connecting the second port to the fourth

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port, and to a second position for permitting the exhaust gas to flow in a direction opposite to the first direction through said exhaust gas purifying means by connecting the first port to the fourth port and connecting the second port to the third port.

2. An exhaust emission control system of an internal combustion engine according to claim 1, wherein said flow direction switching means can be switched over to a third position in which the first port is connectable to the second port.

3. An exhaust emission control system of an internal combustion engine according to claim 1, wherein said exhaust gas purifying means is an NOx storage-reduction catalyst for absorbing NO_x when an air/fuel ratio of the inflow exhaust gas is lean, and desorbing NO_x absorbed thereto when a concentration of oxygen in the inflow exhaust gas decreases.

4. An exhaust emission control system of an internal combustion engine according to claim 2, wherein when in a SO_x desorbing process of desorbing SO_x absorbed to said NOx storage-reduction catalyst from said NOx storage-reduction catalyst, said flow direction switching

means is switched over to the first position and the second position, thereby making a flow direction of the exhaust gas flowing through said NOx storage-reduction catalyst opposite to the direction when absorbing NO_x.

~~5~~ 4. An exhaust emission control system of an internal combustion engine according to claim 4, wherein said exhaust gas purifying means composed of said NOx storage-reduction catalyst exhibits higher SO_x absorbing power than that of an NOx storage-reduction catalyst disposed on an outlet side in the flow direction of the exhaust gas when absorbing NO_x.

~~6~~ 5. An exhaust emission control system of an internal combustion engine according to claim ~~4~~ 3, further comprising heating means for heating a portion close to an inlet of said NOx storage-reduction catalyst in the flow direction of the exhaust gas when said NOx storage-reduction catalyst absorbs NO_x.

~~7~~ 6. An exhaust emission control system of an internal combustion engine according to claim ~~4~~ 3, wherein the switch-over of said flow direction switching means when in the SO_x desorbing process is executed when an exhaust gas temperature or a catalytic temperature of said NOx

storage-reduction catalyst rises.

7 8. An exhaust emission control system of an internal combustion engine according to claim 4, 3 wherein lengths of said third exhaust passageway and of said fourth exhaust passageway are set so that a distance from said internal combustion engine to said NOx storage-reduction catalyst is shorter when absorbing NO_x than when in the SO_x desorbing process by switching over said flow direction switching means to the first position or the second position.

8 9. An exhaust emission control system of an internal combustion engine according to claim 8, 2 wherein a sweeper is provided at said second exhaust passageway.

9 10. An exhaust emission control system of an internal combustion engine according to claim 9, 6 wherein said sweeper is a selective reduction type NO_x catalyst for reducing or dissolving NO_x under an existence of hydro carbon in an over-oxygen atmosphere.

10 11. An exhaust emission control system of an internal combustion engine according to claim 9, 6 wherein another catalyst is provided in said first exhaust passageway, and

said flow direction switching means is switched over to the third position for connecting the first port to the second port for an initial predetermined time during the SO_x desorbing process and, after the predetermined time has elapsed, switched over to make the flow direction of the exhaust gas flowing though said NOx storage-reduction catalyst opposite to the direction when absorbing NO_x.

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12. An exhaust emission control system of an internal combustion engine according to claim 9, wherein said NOx storage-reduction catalyst and said sweeper are integrated into one unit so that the exhaust gas can not flow therebetween and the heat can be transmitted therebetween.

13. An exhaust emission control system of an internal combustion engine according to claim 1, wherein lengths of said third exhaust passageway and of said fourth exhaust passageway are set so that a distance from said internal combustion engine to said exhaust gas purifying means becomes different by switching over said flow direction switching means to the first position or the second position.

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14. An exhaust emission control system of an internal

combustion engine according to claim 13, wherein the switch-over of said flow direction switching means is executed based on an exhaust gas temperature or a temperature of said exhaust gas purifying means.

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~~15~~. An exhaust emission control system of an internal combustion engine according to claim ~~14~~ 16, wherein said exhaust gas purifying means is an NOx storage-reduction catalyst for absorbing NO_x when an air/fuel ratio of the inflow exhaust gas is lean, and desorbing NO_x absorbed thereto when a concentration of oxygen in the inflow exhaust gas decreases.

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~~16~~. An exhaust emission control system of an internal combustion engine according to claim ~~15~~ 17, wherein said flow direction switching means is switched over by selecting a flow path having a shorter distance from said internal combustion engine to said NOx storage-reduction catalyst when in the SO_x desorbing process of desorbing SO_x desorbed to said NOx storage-reduction catalyst from said NOx storage-reduction catalyst.

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~~17~~. An exhaust emission control system of an internal combustion engine according to claim ~~15~~ 17, wherein said flow direction switching means is switched over by selecting a

flow path having a longer distance from said internal combustion engine to said NOx storage-reduction catalyst when said NOx storage-reduction catalyst absorbs NO_x and when the exhaust gas temperature or the catalytic temperature of said NOx storage-reduction catalyst is over a predetermined temperature, and selecting a flow path having a shorter distance from said internal combustion engine to said NOx storage-reduction catalyst when said NOx storage-reduction catalyst absorbs NO_x and when the exhaust gas temperature or the catalytic temperature is lower than the predetermined temperature.

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~~18~~. An exhaust emission control system of an internal combustion engine according to claim ~~15~~ 17, wherein a sweeper is provided at said second exhaust passageway, and said flow direction switching means can be switched over to a third position in which the first port can be connected to the second port,

when the catalytic temperature of said NOx storage-reduction catalyst is higher than a NO_x absorbable temperature range of said NOx storage-reduction catalyst, said flow direction switching means is selectively switched over to the third position.

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~~19~~. An exhaust emission control system of an internal

combustion engine according to claim 17, wherein a cooling device for cooling the exhaust gas is provided at either said third exhaust passageway or said fourth exhaust passageway, which increases the distance from said internal combustion engine to said NOx storage-reduction catalyst.

20. An exhaust emission control system of an internal combustion engine according to claim 3, wherein said first exhaust passageway is provided with a SO_x absorbing agent for absorbing SO_x when the air/fuel ratio of the inflow exhaust gas is lean, and desorbs SO_x absorbed thereto when a concentration of oxygen in the inflow exhaust gas decreases, and

said flow direction switching means can be switched over to the third position in which to connect the first port to the second port, and is selectively switched over to the third position when said internal combustion engine comes to a continuous stoichiometric ratio operation.

21. An exhaust emission control system of an internal combustion engine according to claim 20, wherein said SO_x absorbing agent and said NOx storage-reduction catalyst are concentrically disposed.

22. An exhaust emission control system of an internal combustion engine according to claim 13, wherein said first exhaust passageway is provided with a three-way catalyst exhibiting SO_x absorbing power, and

said flow direction switching means can be switched over to the third position in which the first port is connectable to the second port, and is selectively switched over to the third position when said internal combustion engine comes to a continuous stoichiometric ratio operation.

23. An exhaust emission control system of an internal combustion engine according to claim 1, wherein said exhaust gas purifying means is a catalyst,

any one of said third exhaust passageway and said fourth exhaust passageway is provided with an HC adsorbing agent for adsorbing hydro carbon, and

said flow direction switching means is switched over to select a flow path on which said catalyst is positioned more upstream than said HC adsorbing agent when the temperature of the exhaust gas or of said HC adsorbing agent is in a temperature region where said HC adsorbing agent adsorbs the hydro carbon, and to select a flow path on which said HC adsorbing agent is positioned more upstream than said catalyst when the temperature of the

exhaust gas of of said HC adsorbing agent is in a temperature region where said HC adsorbing agent desorbs the hydro carbon.